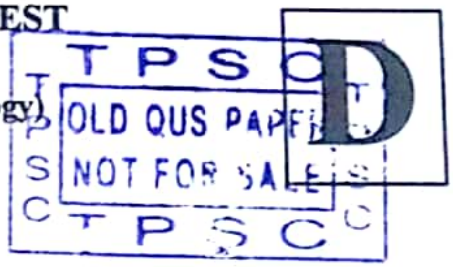
DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO

TR/DLTI/FPT/P-II/17

Test Booklet Series

TEST BOOKLET
GENERAL ABILITY TEST
(PART– II)
(Food Processing Technology)



_____
(Signature of the Candidate)

_____
(Invigilator's Signature)

Time Allowed : 1 hour 30 minutes (One hour thirty minutes) **Maximum Marks : 60**

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE SCREENING TEST, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.**
3. This Test Booklet contains 60 items (questions). Each question, carrying 1 (one) mark only, has four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose ONLY ONE response for each item.
4. You have to mark all your responses by **Black Ball Point Pen only** on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. All items carry equal marks.
6. Before you proceed to mark in the Answer Sheet the responses to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet.
7. After you have completed filling in responses on the Answer Sheet and the Screening Test is completed, you should handover the Answer Sheet to the Invigilator only. You are permitted to take the Test Booklet with you.
8. Sheets for rough work are appended on the Test Booklet at the end.
9. **Penalty for wrong answers :**
   (a) There will be four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to that question will be deducted as penalty.
   (b) If a candidate gives more than one answer, it will be treated as a **Wrong Answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
   (c) If a question is left blank, i.e. no answer is given by the candidate, there will be **no penalty** for that question.

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Four options are given against each of the following questions. Select the best/correct option from among the four options and encode in the answer sheet by **Black Ball Point Pen** only as per example given below :

Example : The capital of India is

(A) Delhi

(C) Indraprastha

● New Delhi

(D) None of these

1. The general chemical formula of carbohydrate is

(A) $(CH_2O)_n$

(B) $(CH_2O)_{2n}$

(C) $(CHO)_n$

(D) $(C_2H_{2n}O)$

2. The glycosidic linkage in cellobiose is

(A) α 1 – 4

(B) β 1 – 4

(C) α 1 – 6

(D) None of these

3. The Lectins are

(A) sugars specific to proteins

(B) proteins specific to sugars

(C) enzymes specific to carbohydrates

(D) carbohydrates specific to enzyme

4. Pick out the odd from the followings :

(A) Deoxyribose

(B) Rhamnose

(C) Fucose

(D) Altrose

5. Which of the following sugar gives a positive result with Seliwanoff test ?

(A) Sucrose

(B) Glucose

(C) Galactose

(D) None of these

6. The undesirable change in a food that makes it unsafe for human consumption is known as

(A) food decay

(B) food spoilage

(C) food loss

(D) All of the above

7. Pasteurization is a

(A) low temperature treatment

(B) steaming treatment

(C) high temperature treatment

(D) both low and high temperature treatment

8. Normally bacteria stop division

(A) at 10°C

(B) at 5°C

(C) at 0°C

(D) None of these

9. Which of the following statements are true retarding Staphylococcus poisoning

(A) is an enterotoxin

(B) causes gastroenteritis

(C) is produced by Staphylococcus aureus

(D) All of these

10. The major carriers of salmonellosis are

(A) meat and eggs

(B) meat and fish

(C) eggs and fish

(D) None of these

11. In a binary solution of components A and B, if component A exhibits positive deviation from Raoult's law then component B

(A) exhibits positive deviation from Raoult's law

(B) exhibits negative deviation from Raoult's law

(C) obeys Raoult's law

(D) may exhibit postive or negative deviation from Raoult's law

12. The molar composition of gas is 10% H_2, 10% O_2, 30% CO_2 and balance HO_y. If 50% H_2O condenses, the final mole per cent of H_2 in the gas on a dry basis will be

(A) 10%

(B) 5%

(C) 18.8%

(D) 20%

13. Which of the following is not equivalent to 1 standard atmospheric pressure?

(A) 1.013 bar

(B) 1.013 Pa

(C) 760 mm Hg

(D) 1.013×10^5 N/m²

14. Volume of 1 Kg-mole gas at standard condition is

(A) 22.4 lit

(B) 22.4 cc

(C) 359 cuft

(D) 22.4 m^3

15. The equation $y = k.c^x$ will produce a straight line in

(A) linear graph paper

(B) log-log graph paper

(C) semi-log graph paper

(D) triangular graph paper

16. Why are fins provided on heat transferring surface ?

(A) to increase temperature gradient

(B) to increase heat transfer co-efficient

(C) to increase heat transfer area

(D) None of these

17. The Nusselt number, in case of forced convection, is a function of

(A) Weber number and Mack number

(B) Grashoff number and Prandtl number

(C) Reynolds number

(D) Reynolds number and Prandtl number

18. In transient heat conduction, the two dimensionless parametes are

(A) Fourier and Reynolds number

(B) Reynolds and Prandtl number

(C) Biot and Fourier number

(D) Reynolds and Biot number

19. The temperature distribution for a plane wall, for steady state heat flow and constant value of thermal conductivity is

(A) logarithmic

(B) paraboilc

(C) linear

(D) None of the above

20. Three fins of equal length and diameter but made of aluminium, brass and cast iron are heated to 200°C at one end. If the fins dissipate heat to the surrounding air at 25°C, the temperature at the free end will be least in case of

(A) Aluminium fin

(B) Brass fin

(C) Cast iron fin

(D) Each fin will have same temperature at the free end

[Turn over

21. The rate constant of a reaction is 0.5 mol/L.h, what will be the concentration of A after 4 hours if initial concentration of A is 1.2 mol/L ?

(A) 0.8 mol/L

(B) 0.9 mol/L

(C) zero

(D) 0.6 mol/L

22. A first order reaction is going on in an isothermal batch reactor such that the conversion of a liquid reactant is 70% in 19 minutes. Calculate the space time to effect this conversion in a plug flow reactor of a constant density system ?

(A) 19 min

(B) 14 min

(C) 22 min

(D) 8 min

23. The activation energy of a chemical reaction in the absence of a catalyst is 16204 cal/mol and in the presence of a catalyst is 10220 cal/mol. How many times the rate of reaction will increase in presence of catalyst, if the reaction proceeds at 27°C ?

(A) 1416

(B) 21447

(C) 30016

(D) None of these

24. Four multiple reactions $2A \rightarrow B$, $2B \rightarrow C$, when the number of moles of A and B is 0.3 and 0.5 respectively and the initial number of moles of A are 2.2. Calculate the number of moles of C present.

(A) 0.32 moles

(B) 0.45 moles

(C) 0.24 moles

(D) None of these

25. At 620 K, the rate of reaction is 6 times the rate at 460K. Calulate the activation energy requires for this reaction from collision theory ?

(A) 5.855 kcal/mol

(B) 2.346 kcal/mol

(C) 3.408 kcal /mol

(D) None of these

26. Calculate the time required to carry a flow of 56 L/sec, if the loss of head is not to exceed 7m per km. Assume friction factor (f) = 0.18.

(A) 0.212m

(B) 0.285m

(C) 0.368m

(D) None of these

27. Calculate the power required per kilometer of a pipe to overcome the viscous resistance to the flow of a liquid through a horizontal pipe of a diameter 110 mm at the rate of 10L/s. Take $\mu = 10$ Poise and kinematic viscosity = 6 stokes.

(A) 14.63 watt

(B) 27.82 watt

(C) 18.91 watt

(D) 31.16 watt

28. A water tank is connected to a 28 cm diameter, 1.6 km long horizontal pipe. The pipe discharges freely into atmosphere on the downstream side. The head over the centre line of the pipe is 36m and the friction factor is 0.018. Calculate the discharge through the pipe.

(A) 210.5 L/s

(B) 130.2 L/s

(C) 160.4 L/s

(D) None of these

29. A fluid is supplied between two reservoirs with the help of three parallel pipe, their respective diameters being 2x, 3x and 4x respectively. They are all of same length L and have the same friction factor f. Calculate the discharge through the smallest pipe, if the largest carries 75 L/s.

(A) 0.01649 m^3/s

(B) 0.00128 m^3/s

(C) 0.00234 m^3/s

(D) None of these

30. Water is flowing through a horizontal pipe with a flow rate of 320 L/s. The diameter of a pipe is suddenly enlarged from 260mm to 620mm. The pressure intensity in the smaller pipe is 18 N/cm^2. Calculate the amount of power loss due to sudden enlargement of the pipe.

(A) 11.42 kW

(B) 3.95 kW

(C) 1.84 kW

(D) None of these

31. P^H value of a solution containing equal concentration of hydroxyl and hydrogen ions will be

(A) 0

(B) 10

(C) 7

(D) 14

32. The energy consumed by a ball mill depends on

(A) its speed

(B) its ball load

(C) the density of material

(D) All of them

33. To remove dirt from flowing fluid we use

(A) coagulant

(B) gravity settler

(C) strains

(D) clarifier

34. For a multi pass shell and tube heat exchanger, the LMTD correction factor is always

(A) 1

(B) >1

(C) <1

(D) between 1 and 2

35. Flooding results in

(A) high tray efficiency

(B) low tray efficiency

(C) high gas velocity

(D) None of these

36. Azeotrope distillation is employed to separate

(A) constant boiling mixture

(B) high boiling mixture

(C) high relative volatility mixture

(D) heat sensitive materials

37. As the reflux ratio decreases, the

(A) separation becomes more efficient

(B) number of plates decreases

(C) column diameter increases

(D) None of these

38. Selectivity of the solvent used in solvent extraction should be

(A) 1

(B) > 1

(C) < 1

(D) 0

39. If moisture content of solid on dry basis is X, then the same on wet basis is

(A) $X/(1+X)$

(B) $X/(1-X)$

(C) $(1+X)/X$

(D) $(1-X)/X$

40. Which of the following flow metering instruments is an area meter ?

(A) Venturimeter

(B) Rotameter

(C) Pitot tube

(D) Hot wire anemometer

41. Routh stability method uses ..... loop transfer function.

Choose the right word for the blank / gap.

(A) open

(B) closed

(C) either (A) or (B)

(D) neither (A) nor (B)

42. Concentration of sugar solution can be determined by the

(A) polarimetry

(B) flame photometry

(C) spectroscopy

(D) oscillometry

43. A control system has the following transfer function, $F(s) = [(s-1)(s+1)] / [s(s-2)(s+4)]$. The initial value of the corresponding time function is

(A) 1

(B) 1/8

(C) 7/8

(D) –1

44. A first order system with unity gain and time constant T is subjected to a sinusoidal input of frequency 1/T. The amplitude ratio of this system is

(A) 1

(B) 0.5

(C) $1/\sqrt{2}$

(D) 0.25

45. In an ideal gas mixture, fugacity of a species is equal to its

(A) vapour pressure

(B) partial pressure

(C) chemical potential

(D) None of these

46. A solid is transformed into vapour without going to the liquid phase at

(A) triple point

(B) boiling point

(C) below triple point

(D) At any temp

47. According to Bode Stability criteria, a system is unstable, if the open loop frequency response exhibits an amplitude ratio exceeding unity at frequency for which phase lag is

(A) 0°

(B) 45°

(C) 90°

(D) 180°

48. With decrease in temperature the equilibrium conversion of a reversible endothermic reaction

(A) decreases

(B) increases

(C) unaffected

(D) increases linearly with temperature

49. What i s the slope of the feed line, if the feed to a distillation column is a saturated liquid ?

(A) 0

(B) infinity

(C) > 1

(D) < 1

50. Welded joint efficiency in the design of chemical process equipment is taken as

(A) 0.55

(B) 0.75

(C) 0.85

(D) 0.95

51. Longitudinal stress induced in a thin walled cylindrical storage vessel is

(A) pD/2t

(B) pD/4t

(C) pD/3t

(D) pD / 6t

52. Which of the following is a manmade source of air pollution ?

(A) Automobile exhaust

(B) Forest fire

(C) Bacterial action in soil

(D) All of these

53. In sewage treatment the detention period allowed for oxidation ponds ranges from ..... weeks.

Choose the right option for the blank /gap

(A) 1 – 2

(B) 4 – 5

(C) 9 – 10

(D) 15 – 20

54. Natural gasoline is produced

(A) from oil seeds

(B) in oil refineries

(C) by natural gas stripping

(D) None of these

55. Transfer of any gene into a completely different organism can be done through

(A) genetic engineering

(B) tissue culture

(C) transformation

(D) None of these

56. The basis of DNA fingerprinting is

(A) the double helix

(B) errors in base sequence

(C) polymorphism in sequence

(D) DNA replication

57. Which one of the following can help in the diagnosis of a genetical disorder ?

(A) ELISA

(B) ABO blood groups

(C) PCR

(D) NMR

58. This method of finding gene is used when researchers know very little about the gene they are trying to find . This process results in a complete gene library ; a collection of copies of DNA fragments that represents the entire genome of an organism.

(A) cloning

(B) shotgun cloning

(C) gene synthesis cloning

(D) PCR

59. Diabetic people need to

(A) increase water intake

(B) reduce water intake

(C) eliminate any physical activity

(D) enhance any physical activity

60. Rich sources in vitamin B are

(A) liver

(B) fresh liver oils

(C) green laefy vegetables

(D) egg yolk.

(Space for rough work)